# CHAPTER 5

## WATER QUALITY PARTNERSHIPS IN THE LOWER DUCK RIVER WATERSHED



**5.1. BACKGROUND.** The Watershed Approach relies on participation at the federal, state, local and nongovernmental levels to be successful. Two types of partnerships are critical to ensure success:

- Partnerships between agencies
- Partnerships between agencies and landowners

This chapter describes both types of partnerships in the Lower Duck River Watershed. The information presented is provided by the agencies and organizations described.

## 5.2. FEDERAL PARTNERSHIPS.

**5.2.A.** Natural Resources Conservation Service. The Natural Resources Conservation Service (NRCS), an agency of the U.S. Department of Agriculture, provides technical assistance, information, and advice to citizens in their efforts to conserve soil, water, plant, animal, and air resources on private lands.

Performance Results System (PRS) is a Web-based database application providing USDA Natural Resources Conservation Service, conservation partners, and the public fast and easy access to accomplishments and progress toward strategies and performance. The PRS may be viewed at http://prms.nrcs.usda.gov/prs. From the opening menu, select "Reports" in the top tool bar. Next, select "2004 Reports" if it's active, and "2003 PRMS Reports" if it's not. Pick the conservation treatment of interest on the page that comes up and reset the date to 2004 Reports if it is not set there. Pick the conservation practice of interest. In the location drop box of the page that comes up, select "Tennessee" and click on the "Refresh" button. In the "By" drop box that comes up, select "Hydrologic Unit" and click on the "Refresh" button. The report of interest can now be viewed.

The data can be used to determine broad distribution trends in service provided to customers by NRCS conservation partnerships. These data do not show sufficient detail to enable evaluation of site-specific conditions (e.g., privately-owned farms and ranches) and are intended to reflect general trends.

| CONSERVATION PRACTICE | TOTAL | |
|---|---|---|
| | FEET | ACRES |
| Comprehensive Nutrient Management Plans | | 2,113 |
| Streambank and Shoreline Protection | 1,930 | |
| Pest Management | | 2,297 |
| Land Treatment: Buffers | 15,470 | 72 |
| Grazing/Forages Practices | 67,171 | 2,591 |

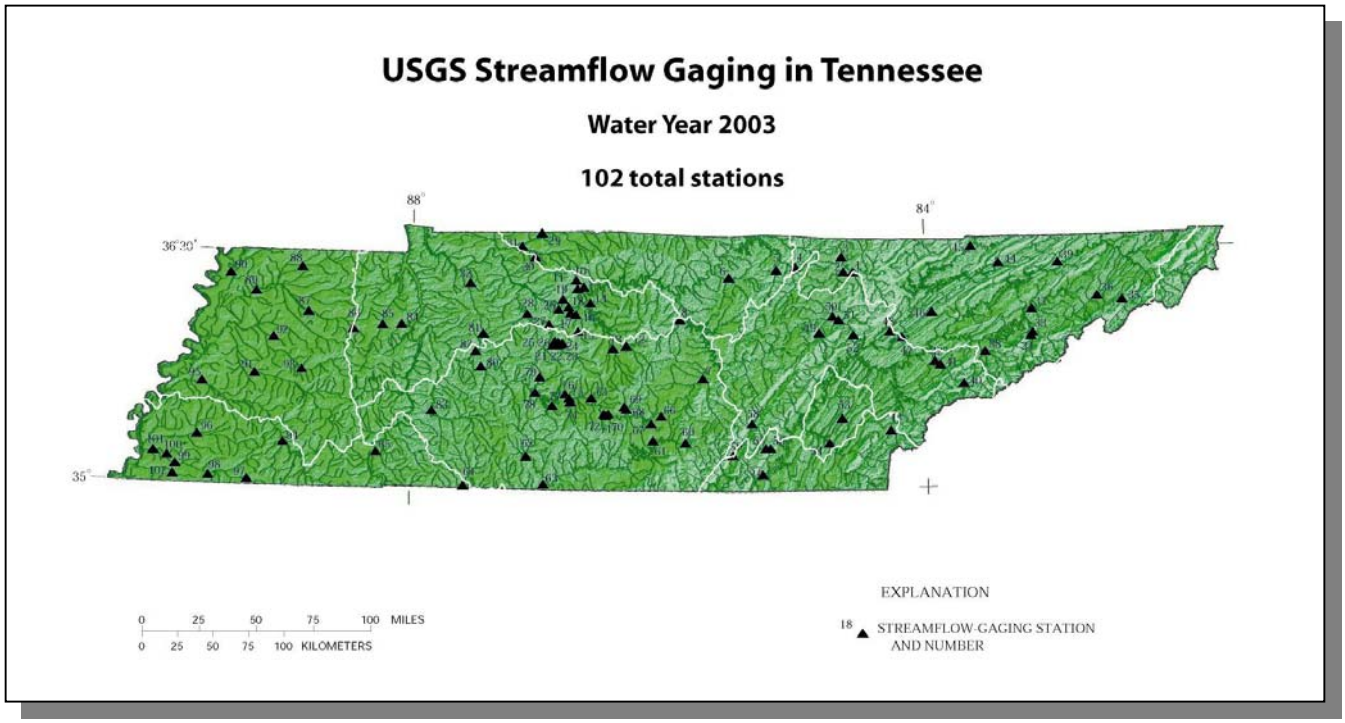
***Table 5-1. Landowner Conservation Practices in Partnership with NRCS in the Lower Duck River Watershed.*** *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period. More information is provided in Appendix V.*

**5.2.B.** United States Geological Survey Water Resources Programs – Tennessee District The U.S. Geological Survey (USGS) provides relevant and objective scientific studies and information for public use to evaluate the quantity, quality, and use of the Nation's water resources. In addition to providing National assessments, the USGS also conducts hydrologic studies in cooperation with numerous Federal, State, and local agencies to address issues of National, regional, and local concern. Please visit http://water.usgs.gov/ for an overview of the USGS, Water Resources Discipline.

The USGS collects hydrologic data to document current conditions and provide a basis for understanding hydrologic systems and solving hydrologic problems. In Tennessee, the USGS records streamflow continuously at more than 102 gaging stations equipped

with recorders and makes instantaneous measurements of streamflow at many other locations. Ground-water levels are monitored Statewide, and the physical, chemical, and biologic characteristics of surface and ground waters are analyzed. USGS activities also include the annual compilation of water-use records and collection of data for National baseline and water-quality networks. National programs conducted by the USGS include the National Atmospheric Deposition Program (http://bqs.usgs.gov/acidrain/), National Stream Quality Accounting Network (http://water.usgs.gov/nasqan/), and the National Water-Quality Assessment Program (http://water.usgs.gov/nawqa/). For specific information on the Upper and Lower Tennessee NAWQA studies, please visit http://tn.water.usgs.gov/lten/tenn.html

*USGS Water Resources Information on the Internet.* Real-time and historical streamflow, water levels, and water-quality data at sites operated by the Tennessee District can be accessed at http://waterdata.usgs.gov/tn/nwis/nwis. Data can be retrieved by county, hydrologic unit code, or major river basin using drop-down menus. Contact Donna Flohr at (615) 837-4730 or dfflohr@usgs.gov for specific information about streamflow data. Recent publications by the USGS staff in Tennessee can be accessed by visiting http://tn.water.usgs.gov/pubpg.html. This web page provides searchable bibliographic information to locate reports and other products about specific areas.



**5.2.C.** U.S. Fish and Wildlife Service. The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. Sustaining our nation's fish and wildlife resources is a task that can be accomplished only through the combined efforts of governments, businesses, and private citizens. The U.S. Fish and Wildlife Service (Service) works with State and Federal agencies and Tribal governments, helps corporate and private landowners conserve habitat, and cooperates with other nations to halt illegal wildlife trade. The Service also administers a Federal Aid program that distributes funds annually to States for fish and wildlife restoration, boating access, hunter education, and related projects across America. The funds come from Federal excise taxes on fishing, hunting, and boating equipment.

*Endangered Species Program*

Through the Endangered Species Program, the Service consults with other federal agencies concerning their program activities and their effects on endangered and threatened species. Other Service activities under the Endangered Species Program include the listing of rare species under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.) and the recovery of listed species. Once listed, a species is afforded the full range of protections available under the ESA, including prohibitions on killing, harming or otherwise taking a species. In some instances, species listing can be avoided by the development of Candidate Conservation Agreements, which may remove threats facing the candidate species, and funding efforts such as the Private Stewardship Grant Program. Federally endangered and threatened species in this portion of the Duck River watershed include the gray bat (*Myotis grisescens*), bald eagle (*Haliaeetus leucocephalus*), oyster mussel (*Epioblasma capsaeformis*), pygmy madtom (*Noturus stanauli*), Eggert's sunflower (*Helianthus eggertii*), Price's potato-bean (*Apios priceana*), and Tennessee yellow-eyed grass (*Xyris tennesseensis*). Federally designated critical habitat for the endangered oyster mussel and Cumberlandian combshell exists in the mainstem Duck River, from the First Street bridge in Columbia (milepoint 133) upstream to Lillard Mill Dam (milepoint 179), in Maury and Marshall Counties. For a complete listing of endangered and threatened species in Tennessee, please visit the Service's website at http://www.fws.gov/cookeville/.

Recovery is the process by which the decline of an endangered or threatened species is stopped and reversed, and threats to the species' survival are eliminated, so that long-term survival in nature can be ensured. The goal of the recovery process is to restore listed species to a point where they are secure and self-sustaining in the wild and can be removed from the endangered species list. Under the ESA, the Service and National Marine Fisheries Service were delegated the responsibility of carrying out the recovery program for all listed species.

Utilizing funding provided through the Service's Landowner Incentives Program (LIP), the Tennessee Wildlife Resources Agency (TWRA), the Tennessee Nature Conservancy (TNC), and private landowners are implementing habitat restoration activities in the Duck River watershed. The LIP is a new effort of the Service's endangered species recovery program focusing on the enhancement of in-stream aquatic habitats and the protection and restoration of riparian habitats for the numerous federally listed species which occur in the watershed.

In a partnership with the TNC, TWRA, and Tennessee Department of Environment and Conservation (TDEC) Division of Natural Heritage, the Service developed a State Conservation Agreement for Cave Dependent Species in Tennessee (SCA). The SCA targets unlisted but rare species and protects these species through a suite of proactive conservation agreements. The goal is to preclude the need to list these species under the ESA. This agreement covers middle and eastern Tennessee and will benefit water quality in many watersheds within the State.

The Service is actively involved with the Duck River Agency in addressing existing water quality impairments of the watershed and the water supply needs of the local region.

In an effort to preclude the listing of a rare species, the Service engages in proactive conservation efforts for unlisted species. The program covers not only formal candidates but other rare species that are under threat. Early intervention preserves management options and minimizes the cost of recovery.

*Partners for Fish and Wildlife Program*

The U.S. Fish and Wildlife Service established the Partners for Fish and Wildlife Program to restore historic habitat types that benefit native fishes and wildlife. The program adheres to the concept that restoring or enhancing habitats such as wetlands or other unique habitat types will substantially benefit federal trust species on private lands by providing food and cover or other essential needs. Federal trust species include threatened and endangered species, as well as migratory birds (e.g. waterfowl, wading birds, shorebirds, neotropical migratory songbirds).

Participation is voluntary and various types of projects are available. Projects include livestock exclusion fencing, alternate water supply construction, streambank stabilization, restoration of native vegetation, wetland restoration/enhancement, riparian zone reforestation, and restoration of in-stream aquatic habitats.

The Service is actively involved with the Natural Resources Conservation Service and private landowners in the Duck River watershed to protect riparian habitats for the numerous federally listed aquatic species that occur. Specific projects have included the installation of livestock exclusion fencing and alternate water supply sources.

*HOW TO PARTICIPATE*

- Interested landowners contact a Partners for Fish and Wildlife Biologist to discuss the proposed project and establish a site visit.
- A visit to the site is then used to determine which activities the landowner desires and how those activities will enhance habitat for trust resources. Technical advice on proposed activities is provided by the Service, as appropriate.
- Proposed cost estimates are discussed by the Service and landowner.
- A detailed proposal which describes the proposed activities is developed by the Service biologist and the landowner. Funds are competitive, therefore the proposal is submitted to the Service's Ecosystem team for ranking and then to the Regional Office for funding.
- After funding is approved, the landowner and the Service co-sign a Wildlife

Extension Agreement (minimum 10-year duration).
- Project installation begins.
- When the project is completed, the Service reimburses the landowner after receipts and other documentation are submitted according to the Wildlife Extension Agreement.

For more information regarding the Endangered Species and Partners for Fish and Wildlife programs, please contact the Tennessee Ecological Services Field Office at (931)-528-6481 or visit their website at http://www.fws.gov/cookeville/.

**5.2.D.** Tennessee Valley Authority (TVA). The Tennessee Valley Authority's (TVA) goals for the 21st Century are to generate prosperity for the Tennessee Valley by promoting economic development, supplying low-cost, reliable power, and supporting a thriving river system. TVA is committed to the sustainable development of the region and is engaged in a wide range of watershed protection activities. TVA has seven multidisciplinary Watershed Teams to help communities across the Tennessee Valley actively develop and implement protection and restoration activities in their local watersheds. These teams work in partnership with business, industry, government agencies, and community groups to manage, protect, and improve the quality of the Tennessee River and its tributaries. TVA also operates a comprehensive monitoring program to provide real-time information to the Watershed Teams and other entities about the conditions of these resources. The following is a summary of TVA's resource stewardship activities in the Lower Duck River watershed.

Stream Monitoring

The condition of water resources in the Duck River watershed streams is measured using three independent methods: Index of Biotic Integrity (IBI), number of mayfly, stonefly, and caddisfly taxa (EPT), and Habitat Assessment. Not all of these tools were used at each stream sample site.

*IBI.* The index of biotic integrity (IBI) assesses the quality of water resources in flowing water by examining a stream's fish assemblage. Fish are useful in determining long-term (several years) effects and broad habitat conditions because they are relatively long-lived and mobile. Twelve metrics address species richness and composition, trophic structure (structure of the food chain), fish abundance, and fish health. Each metric reflects the condition of one aspect of the fish assemblage and is scored against reference streams in the region known to be of very high quality. Potential scores for each of the twelve metrics are 1-poor, 3-intermediate, or 5-the best to be expected. Scores for the 12 metrics are summed to produce the IBI for the site. The following table associates IBI ranges with attributes of fish assemblages.

| Attributes | IBI Range |
|---|---|
| Comparable to the best situations without influence of man; all regionally expected species for the habitat and stream size, including the most intolerant forms, are present with full array of age and sex classes; balanced trophic structure. | 58-60 |
| Species richness somewhat below expectation, especially due to loss of most intolerant forms; some species with less than optimal abundance or size distribution; trophic structure shows some signs of stress. | 48-52 |
| Signs of additional deterioration include fewer intolerant forms, more skewed trophic structure (e.g., increasing frequency of omnivores); older age classes of top predators may be rare. | 40-44 |
| Dominated by omnivores, pollution-tolerant forms, and habitat generalists; few top carnivores; growth rates and condition factors commonly depressed; hybrids and diseased fish often present. | 28-34 |
| Few fish present, mostly introduced or tolerant forms; hybrids common; disease, parasites, fin damage, and other anomalies regular. | 12-22 |

*EPT.* The number and types of aquatic insects, like fish, are indicative of the general quality of the environment in which they live. Unlike fish, aquatic insects are useful in determining short-term and localized impacts because they are short-lived and have limited mobility. The method TVA uses involves only qualitative sampling and field identification of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) to the family taxonomic level (EPT). The score for each site is simply the number of EPT families. The higher EPT scores are indicative of high quality streams because these insect larvae are intolerant of poor water quality.

*Habitat Assessment.* The quality and quantity of habitat (physical structure) directly affect aquatic communities. Habitat assessments are done at most stream sampling sites to help interpret IBI and EPT results. If habitat quality at a site is similar to that found at a good reference site, any impacts identified by IBI and EPT scores can reasonably be attributed to water quality problems. However, if habitat at the sample site differs considerably from that at a reference site, lower than expected IBI and EPT scores might be due to degraded habitat rather than water quality impacts.

The habitat assessment method used by TVA (modified EPA protocol) compares observed instream, channel, and bank characteristics at a sample site to those expected at a similar high-quality stream in the region. Each of the stream attributes listed below is given a score of 1 (poorest condition) to 4 (best condition). The habitat score for the sample site is simply the sum of these attributes. Scores can range from a low of 10 to a high of 40.

1. Instream cover (fish)
2. Epifaunal substrate
3. Embeddedness
4. Channel Alteration
5. Sediment Deposition
6. Frequency of Riffle
7. Channel Flow Status
8. Bank vegetation protection - Left bank and right bank, separately
9. Bank stability - Left bank and right bank, separately
10. Riparian vegetation zone width - Left bank and right bank, separately

*Sample Site Selection.* EPT sampling and fish community assessment (IBI) are conducted at the same sites. Site selection is governed primarily by study objectives, stream physical features, and stream access. TVA's objective is to characterize the quality of water resources within a sub-watershed (11-digit hydrologic unit). Sites are typically located in the lower end of sub-watersheds and at intervals on the mainstem to integrate the effects of land use. TVA began monitoring the ecological health of the Lower Duck River in 1990. In 1999, a monitoring plan was implemented for the Duck River watershed with 47 sites selected for routine assessment. These sites are typically sampled every five years to keep a current picture of watershed condition.

*Contacts.* Details about stream bioassessment sampling sites and scores in the Lower Duck River watershed can be obtained by contacting Amy Wales at (423)876-6748 or akwales@tva.gov or http://www.tva.gov.

## Watershed Assistance

At present, TVA is not involved in any large-scale watershed protection or restoration projects in the Lower Duck River watershed. However, TVA has worked with and maintains a relationship with the local NRCS offices and Soil Conservation Districts in the Lower Duck River watershed.

## Protection and Restoration Activities

*Promote Riparian Buffers.* An effective line of water quality protection is maintaining the vegetative plant cover along water bodies. TVA encourages waterfront property owners to maintain or establish vegetated riparian buffers by providing information to the riparian property owner. TVA has also developed a series of 11 fact sheets that will enable riparian property owners to restore, manage, and be better stewards of riparian land. The fact sheets are available on the TVA internet site http://www.tva.com/river/landandshore/index.htm.

Further information on TVA's involvement in the Lower Duck River watershed can be obtained by writing: Tennessee Valley Authority, PO Box 280, Paris, TN 38242 or calling the Kentucky Watershed Team at (731)-641-2026. Also, contact can be made by calling 1-800-TVA-LAND or http://www.tva.gov.

## 5.3. STATE PARTNERSHIPS.

**5.3.A.** TDEC Division of Water Supply. The Source Water Protection Program, authorized by the 1996 Amendments to the Safe Drinking Water Act, outline a comprehensive plan to achieve maximum public health protection. According to the plan, it is essential that every community take these six steps:

1) Delineate the drinking water source protection area
2) Inventory known and potential sources of contamination within these areas
3) Determine the susceptibility of the water supply system to these contaminants
4) Notify and involve the public about threats identified in the contaminant source inventory and what they mean to their public water system
5) Implement management measures to prevent, reduce or eliminate threats
6) Develop contingency planning strategies to deal with water supply contamination or service interruption emergencies (including natural disaster or terrorist activities).

Source water protection has a simple objective: to prevent the pollution of the lakes, rivers, streams, and ground water (wells and springs) that serve as sources of drinking water before they become contaminated. This objective requires locating and addressing potential sources of contamination to these water supplies. There is a growing recognition that effective drinking water system management includes addressing the quality and protection of the water sources.

Source Water Protection has a significant link with the Watershed Management Program goals, objectives and management strategies. Watershed Management looks at the health of the watershed as a whole in areas of discharge permitting, monitoring and protection. That same protection is important to protecting drinking water as well. Communication and coordination with a multitude of agencies is the most critical factor in the success of both Watershed Management and Source Water Protection.

Watershed management plays a role in the protection of both ground water and surface water systems. Watershed Management is particularly important in areas with karst (limestone characterized by solution features such as caves and sinkholes as well as disappearing streams and spring), since the differentiation between ground water and surface water is sometimes nearly impossible. What is surface water can become ground water in the distance of a few feet and vice versa.

Source water protection is not a new concept, but an expansion of existing wellhead protection measures for public water systems relying on ground water to now include surface water. This approach became a national priority, backed by federal funding, when the Safe Drinking Water Act amendments (SDWA) of 1996 were enacted. Under this Act, every public drinking water system in the country is scheduled to receive an assessment of both the sources of potential contamination to its water source of the threat these sources may pose by the year 2003 (extensions were available until 2004). The assessments are intended to enhance the protection of drinking water supplies within existing programs at the federal, state and local levels. Source water assessments were mandated and funded by Congress. Source water protection will be

left up to the individual states and local governments without additional authority from Congress for that progression.

As a part of the Source Water Assessment Program, public water systems are evaluated for their susceptibility to contamination. These individual source water assessments with susceptibility analyses are available to the public at http://www.state.tn.us/environment/dws as well as other information regarding the Source Water Assessment Program and public water systems.

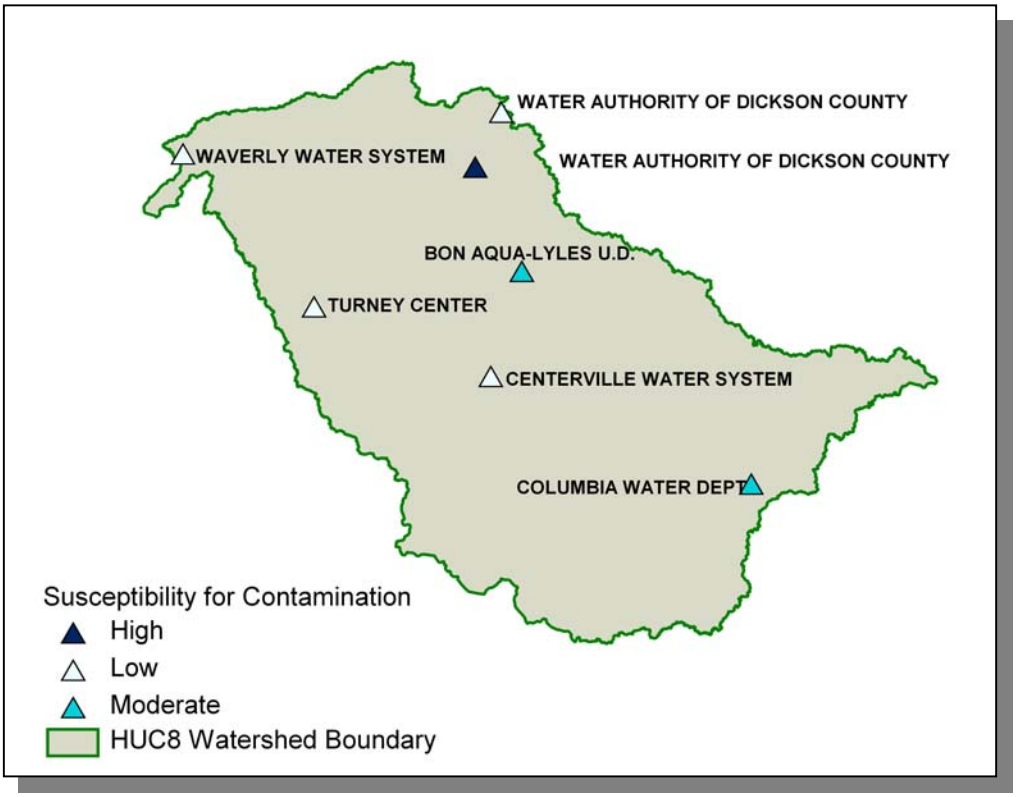



***Figure 5-1. Susceptibility for Contamination in the Lower Duck River Watershed.***

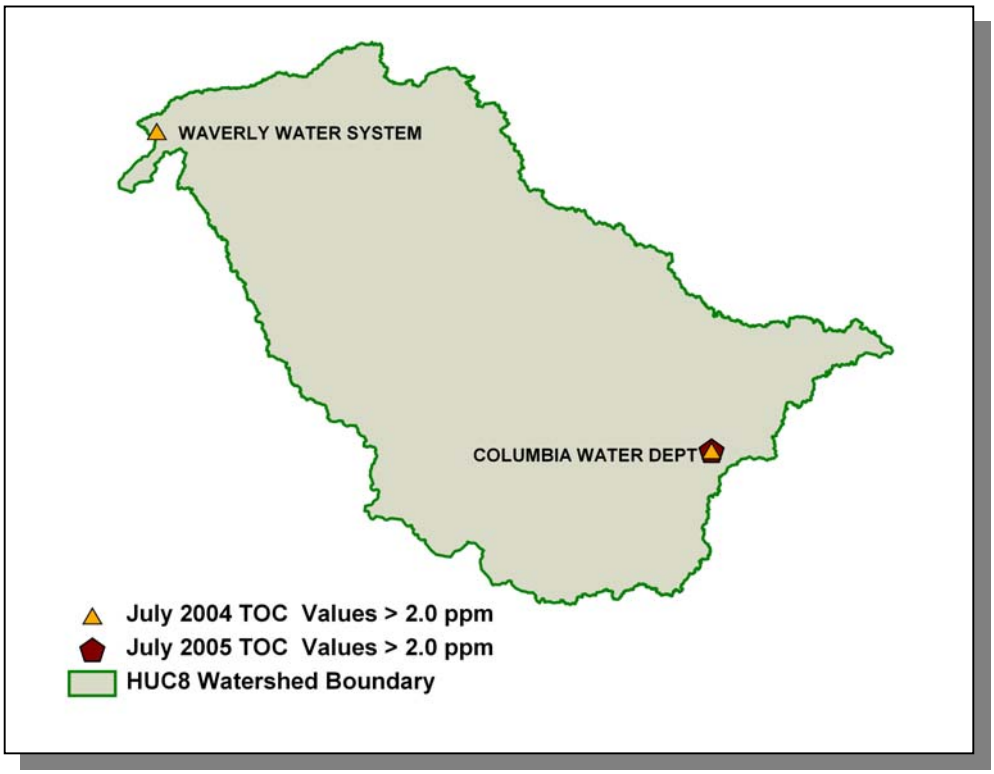



***Figure 5-2. July 2004 and 2005 Raw Water Total Organic Carbon (TOC) Analysis in the Lower Duck River Watershed.***

For further discussion on ground water issues in Tennessee, the reader is referred to the Ground Water Section of the 305(b) Water Quality Report at http://www.tdec.net/water.shtml.

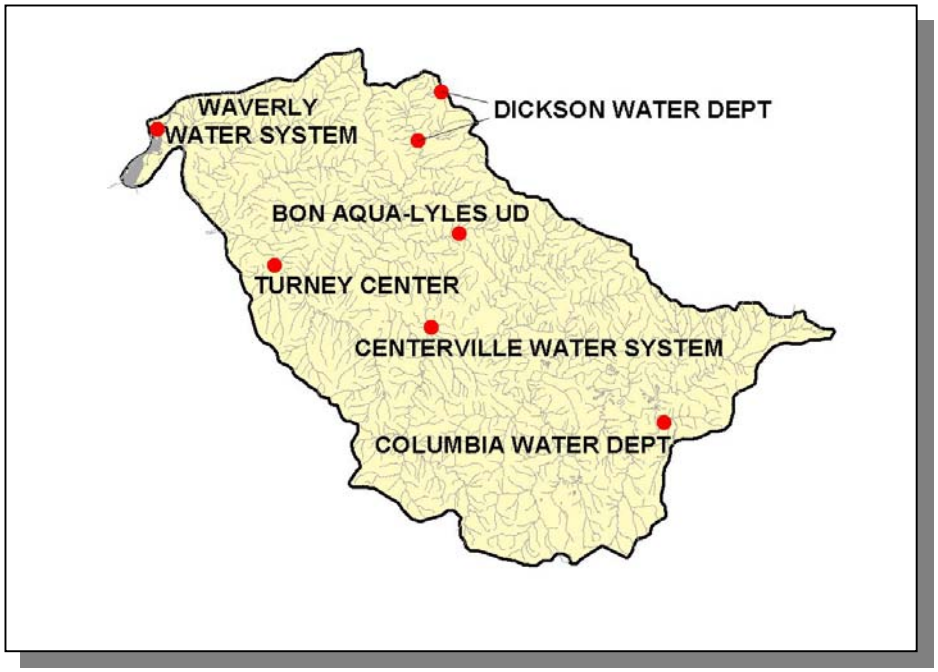



***Figure 5-3. Locations of Community and Non-Community Public Water Supply Intakes in the Lower Duck River Watershed.***

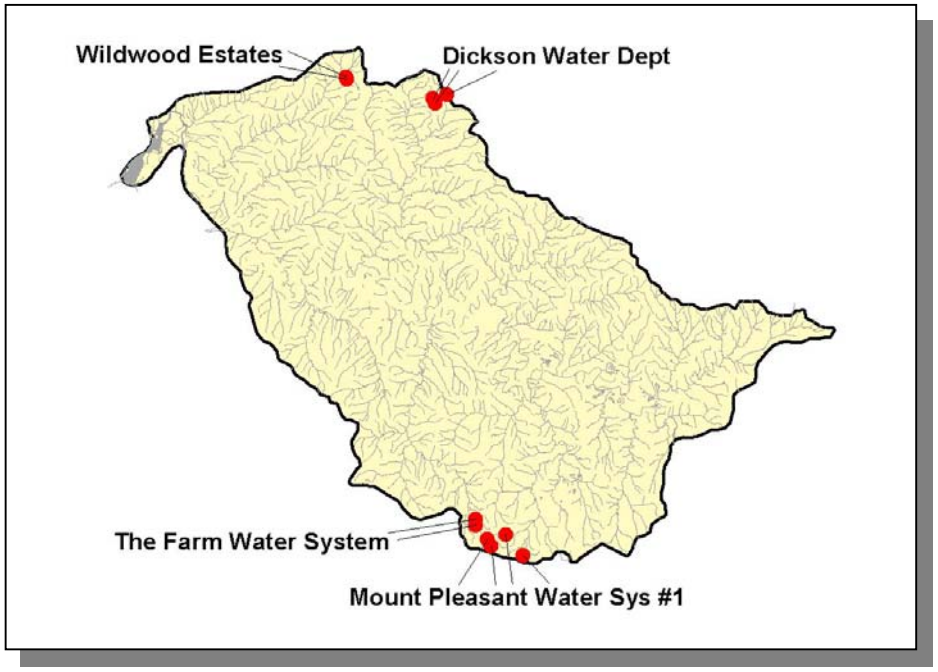



***Figure 5-4. Locations of Community and Public Groundwater Supply Intakes in the Lower Duck River Watershed.***

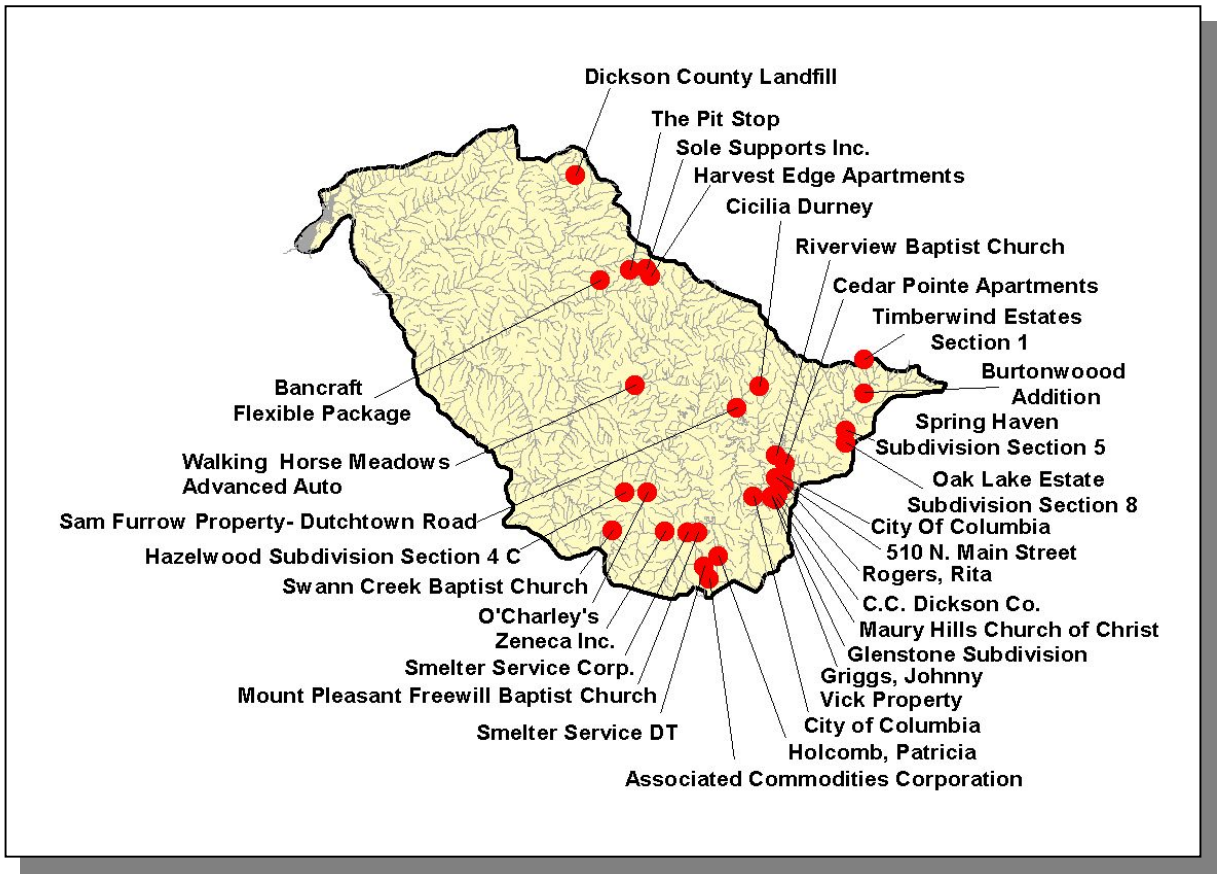



***Figure 5-5. Locations of UIC (Underground Injection Control) Sites in the Lower Duck River Watershed.*** *Injection wells include stormwater sinkholes modified for drainage, commercial/industrial septic tanks, and large capacity septic tanks.*

**5.3.B.** State Revolving Fund. TDEC administers the state's Clean Water State Revolving Fund Program. Amendment of the Federal Clean Water Act in 1987 created the Clean Water State Revolving Fund (SRF) Program to provide low-interest loans to cities, counties, and utility districts for the planning, design, and construction of wastewater facilities. The U.S. Environmental Protection Agency awards annual capitalization grants to fund the program and the State of Tennessee provides a twenty-percent funding match. TDEC has awarded loans totaling approximately $550 million since the creation of the SRF Program. SRF loan repayments are returned to the program and used to fund future SRF loans.

SRF loans are available for planning, design, and construction of wastewater facilities, or any combination thereof. Eligible projects include new construction or upgrading/expansion of existing facilities, including wastewater treatment plants, pump stations, force mains, collector sewers, interceptors, elimination of combined sewer overflows, and nonpoint source pollution remedies.

SRF loan applicants must pledge security for loan repayment, agree to adjust user rates as needed to cover debt service and fund depreciation, and maintain financial records that follow governmental accounting standards. SRF loan interest rates range from zero percent to market rate, depending on the community's per-capita income, taxable sales, and taxable property values. Most SRF loan recipients qualify for interest rates between 2 and 4 percent. Interest rates are fixed for the life of the term of the loan. The maximum loan term is 20 years or the design life of the proposed wastewater facility, whichever is shorter.

TDEC maintains a Priority Ranking System and Priority List for funding the planning, design, and construction of wastewater facilities. The Priority Ranking List forms the basis for funding eligibility determinations and allocation of Clean Water SRF loans. Each project's priority rank is generated from specific priority ranking criteria and the proposed project is then placed on the Project Priority List. Only projects identified on the Project Priority List may be eligible for SRF loans. The process of being placed on the Project Priority List must be initiated by a written request from the potential SRF loan recipient or their engineering consultant. SRF loans are awarded to the highest priority projects that have met SRF technical, financial, and administrative requirements and are ready to proceed.

Since SRF loans include federal funds, each project requires development of a Facilities Plan, an environmental review, opportunities for minority and women business participation, a State-approved sewer use ordinance and Plan of Operation, and interim construction inspections.

For further information about Tennessee's Clean Water SRF Loan Program, call (615) 532-0445 or visit their Web site at http://www.tdec.net/srf.

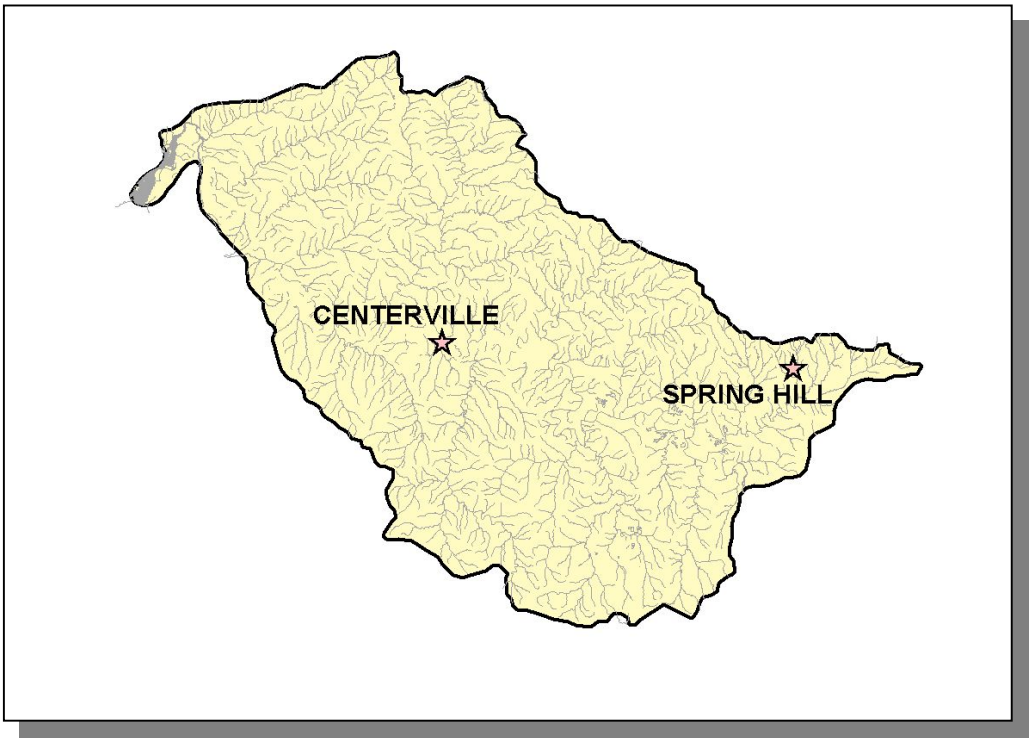



***Figure 5-6. Location of Communities Receiving SRF Loans or Grants in the Lower Duck River Watershed.*** *More information is provided in Appendix V.*

**5.3.C.** Tennessee Department of Agriculture. The Tennessee Department of Agriculture's Water Resources Section consists of the federal Section 319 Nonpoint Source Program and the Agricultural Resources Conservation Fund Program. Both of these are grant programs which award funds to various agencies, non-profit organizations, and universities that undertake projects to improve the quality of Tennessee's waters and/or educate citizens about the many problems and solutions to water pollution. Both programs fund projects associated with what is commonly known as "nonpoint source pollution."

The Tennessee Department of Agriculture's Nonpoint Source Program (TDA-NPS) has the responsibility for management of the federal Nonpoint Source Program, funded by the US Environmental Protection Agency through the authority of Section 319 of the Clean Water Act. This program was created in 1987 as part of the reauthorization of the Clean Water Act, and it established funding for states, territories and Indian tribes to address NPS pollution. Nonpoint source funding is used for installing Best Management Practices (BMPs) to stop known sources of NPS pollution, training, education, demonstrations and water quality monitoring. The TDA-NPS Program is a non-regulatory program, promoting voluntary, incentive-based solutions to NPS problems. The TDA-NPS Program basically funds three types of programs:

- BMP Implementation Projects. These projects aid in the improvement of an impaired waterbody, or prevent a non-impaired water from becoming listed on the 303(d) List.

- Monitoring Projects. Up to 20% of the available grant funds are used to assist the water quality monitoring efforts in Tennessee streams, both in the state's 5-year watershed monitoring program, and also in performing before-and-after BMP installation, so that water quality improvements can be verified. Some monitoring in the Lower Duck River Watershed was funded under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program (U.S. Environmental Protection Agency Assistance Agreements C9994674-00-0, C9994674-01-0, and C9994674-02-0).

- Educational Projects. The intent of educational projects funded through TDA-NPS is to raise the awareness of landowners and other citizens about practical actions that can be taken to eliminate nonpoint sources of pollution to the waters of Tennessee.

The Tennessee Department of Agriculture Agricultural Resources Conservation Fund Program (TDA-ARCF) provides cost-share assistance to landowners across Tennessee to install BMPs that eliminate agricultural nonpoint source pollution. This assistance is provided through Soil Conservation Districts, Resource Conservation and Development Districts, Watershed Districts, universities, and other groups. Additionally, a portion of the TDA-ARCF is used to implement information and education projects statewide, with the focus on landowners, producers, and managers of Tennessee farms and forests.

Participating contractors in the program are encouraged to develop a watershed emphasis for their individual areas of responsibility, focusing on waters listed on the Tennessee 303(d) List as being impaired by agriculture. Current guidelines for the TDA-ARCF are available. Landowners can receive up to 75% of the cost of the BMP as a reimbursement.

Since January of 1999, the Department of Agriculture and the Department of Environment and Conservation have had a Memorandum of Agreement whereby complaints received by TDEC concerning agriculture or silviculture projects would be forwarded to TDA for investigation and possible correction. Should TDA be unable to obtain correction, they would assist TDEC in the enforcement against the violator. More information forestry BMPs is available at:
http://tennessee.gov/agriculture/forestry/BMPs.pdf, and the complaint form is available at: http://tennessee.gov/environment/wpc/logform.php.

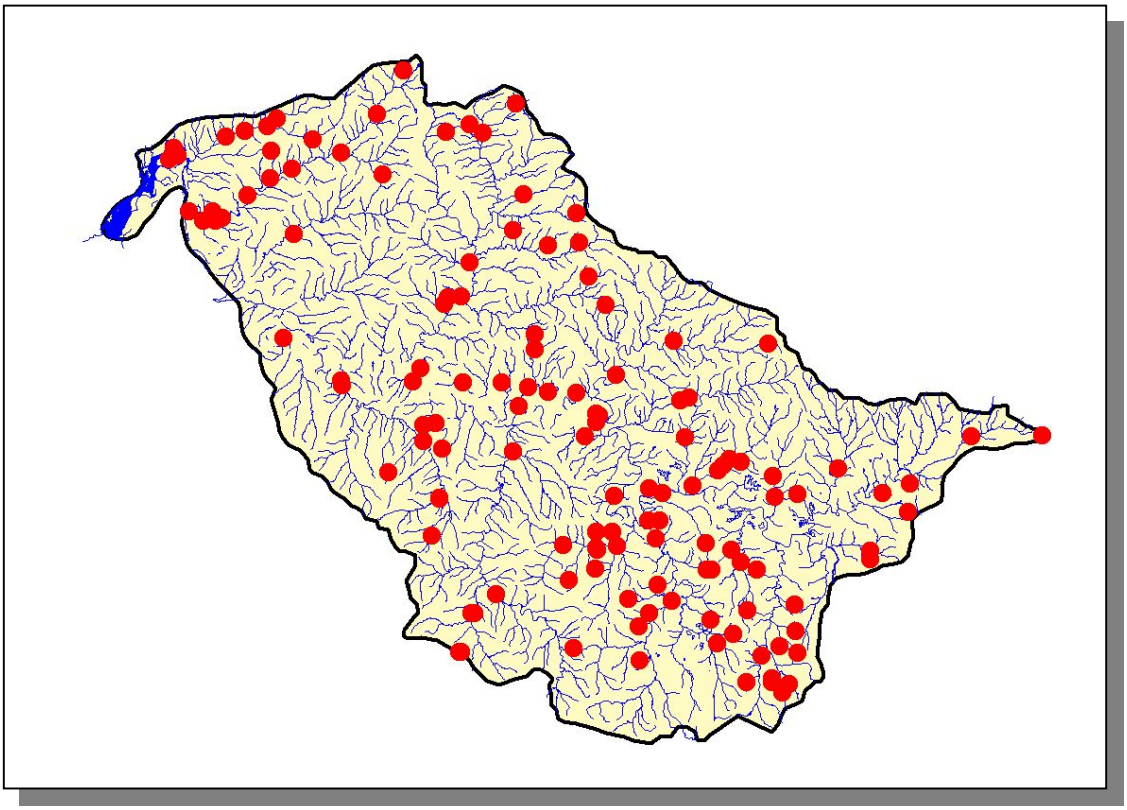


***Figure 5-7. Location of BMPs installed from 1999 through 2003 in the Lower Duck River Watershed with Financial Assistance from the Tennessee Department of Agriculture's Nonpoint Source and Agricultural Resources Conservation Fund Grant Programs.*** *More information is provided in Appendix V.*

## 5.4. LOCAL INITIATIVES.

**5.4.A.** Tennessee Duck River Development Agency. The Tennessee Duck River Development Agency (Duck River Agency or DRA) was created by the Tennessee General Assembly in 1965 as a comprehensive regional development agency. Its broad powers include the "control and development of the water resources" of the Duck River watershed. In 1998 the agency adopted the following mission statement:

"To develop, protect, and sustain a clean and dependable Water Resource for all citizens of the Duck River region".

In recent years the Agency has established two organizations that are providing critical guidance and cooperation in support of that mission. The Duck River Agency Technical Advisory Committee (DRATAC), comprised of the regions public water systems managers, provides direct program development advice and guidance to the Agency. At the same time the Duck River Watershed Water Resources Council (WRC), a voluntary association of virtually every public and private organizations working on water issues in the watershed, has accepted the challenge to develop and maintain a comprehensive water resources plan for the region.

The comprehensive water resources plan has three parts, water supply, water quality and emergency actions. The DRA and DRATAC took the lead developing a twenty-five year action plan as Part I Water Supply. It was approved by the DRA Board of Directors, July 2003 and accepted by the WRC in August 2003. Part I Water Supply plan action items are now being implemented by DRA/DRATAC and their WRC partners, TVA and USGS. Copies of the water supply plan and action item project reports are available from the DRA office.

The WRC is now focused on developing the first edition of Part II of the comprehensive plan, Water Quality Protection and Restoration. The TDEC Duck River Watershed Water Quality Management Plan provides critical elements for the DRA / WRC water quality plan that can be supplemented by WRC members to provide the best guidance and support for future cooperative actions.

For additional information:
Duck River Agency
210 E. Depot Street
Shelbyville, TN 37160
Tel 931-684-7820
duckrvr@bellsouth.net
http://www.duckriveragency.com

**5.4.B.** The Tennessee Scenic River Association's Duck River Opportunities Project. The Tennessee Scenic Rivers Association's Duck River Opportunities Project (DROP) started in 1999 with funding from the Tennessee Environmental Endowment. The basis of the project was to build partnerships to protect and enhance the ecological health of the Duck River and its tributaries. The DROP is pursuing a two-fold approach to addressing local water quality problems. The first approach is the formation of a citizen group whose focus is on the protection and enhancement of the ecological health of the

Duck River and its tributaries. The second approach is working with local communities to develop sub watershed restoration plans and to include activities that can be utilized as demonstration projects as well as enhancement of water quality.

More information about DROP, including the importance of Smart Growth in the Lower Duck River Watershed, and a schedule of events for DROP, can be found at:

http://www.paddletsra.org/duckriver.html

or by contacting John McFadden, Director of Science and Restoration at:

(615)-374-3744
jmcfadden62@earthlink.net

**5.4.C.** Five Rivers RC&D Council. The Mission of the Five Rivers RC&D Council is to promote activities that will enhance the quality of life, conserve natural resources, and promote economic development in the council area.

The Five Rivers RC&D Council covers seven counties in Middle Tennessee. Named for the 5 major rivers flowing through the area, the council serves Cheatham, Dickson, Houston, Humphreys, Montgomery, Robertson, and Stewart Counties. With the natural resources and community activities being diverse in geography, the Council responds to the needs of their local communities, both for conservation issues and for economic and rural development. The collaboration of its numerous partners makes the Five Rivers RC & D Council Area distinctive.

The Five Rivers RC & D Council assists in administering the Resource Conservation and Development Program, which is a unique combination of private enterprise and federal assistance that encourages economic growth through development, conservation and planned utilization of natural resources across the Council Area and Tennessee. Just a few services the RC&D program is providing in our community are Conservation Education, Farmland Protection, providing Technical Assistance, ensuring Community Services, establishing Sustainable Development, encouraging Natural Resources Protection, and Communicating Local Issues.

Since 1999, the Five Rivers RC&D Council has worked with local landowners along the Buffalo and Duck Rivers in Humphreys County to demonstrate solutions to sedimentation and non-point source pollution loading by installing Best Management Practices. The U S Fish & Wildlife Service awarded $20,000 to the Council to assist the enhancements of this watershed. The problems were mostly caused by severe streambank erosion, livestock accessibility to these streams, a lack of buffer or riparian zones, and improper farming techniques that have impaired the river systems.

This project has installed 10,613 linear feet of fencing for livestock use exclusion, and over 1000 linear feet of bioengineering to restore the streambanks and to provide protection against river swells. Landowners have improved their pasture lands by providing intensive rotational grazing systems to adequately feed forages and maintain

healthy open lands. Many included alternatives to watering animals from the streams with new solar ram watering troughs.

The project installations totaled over $47,000 in addition to improving water quality along the Buffalo and Duck Rivers. The knowledge by these landowners will carry on ensuring the rest of the farming community grasped the conservation concepts for generations to come and to expand to others areas in the region.

For more information on the Five Rivers RC&D Council and its programs, contact Chandra Berry, RC&D Coordinator at (931)-368-0252 ext. 5 or visit the web site at: http://www.fiveriversrcd.org.

**5.4.D.** Swan Conservation Trust. Swan Conservation Trust is an all-volunteer 501c(3) land trust organization, founded in 1992, with the mission of protecting forests, streams, and biodiversity on the Western Highland Rim of Tennessee. Native hardwood forests are critical for maintaining clean groundwater and surface waters for municipal water supplies and wells. Healthy streams provide habitat for aquatic species and recreational opportunities for citizens. Riparian areas are home to many of our state's rare plant species and provide rich foraging and nesting areas for wildlife.

Swan Trust's initial focus is on the forests in the headwaters area of Big Swan and Big Bigby Creeks (southeastern Lewis County and southwestern Maury County). Nearly 20,000 acres of forestland in this area was slated to become Maury State Forest in the 1930's under the Fulmer Act. Although protection by the State of Tennessee never came to fruition, about 10,000 acres still remains in large forested tracts with pristine headwater streams, rare plants, and wildlife habitat for aquatic and terrestrial creatures. The public has long enjoyed the area for hunting, recreation, wildlife viewing, and scientific study. Swan Trust's vision is to preserve and protect this large forest from subdivision and development. Protection will be accomplished through ownership, conservation easements, partnerships, or cooperative management agreements.

To this end, Swan Trust has been successful in protecting several tracts in the 10,000-acre region. Through a series of contiguous purchases, roughly 1500 acres, now known as Big Swan Headwaters Nature Preserve, has been set aside in perpetuity for the benefit of wildlife and enjoyment by the public. This headwaters region is known for its abundant seeps, springs, and streams that contribute clean water to Big Swan Creek, which serves as the water supply for the City of Centerville, downstream in Hickman County. Another 100-acre tract in the headwaters of Big Bigby Creek has been purchased and protected as the Highland Woods Preserve. The pristine forest and streams in the Highland Woods help maintain clean groundwater for three area springs used by the Mt. Pleasant water system. Nearby is Stillhouse Hollow Falls, a 92-acre scenic tract under contract for purchase with Tennessee Parks and Greenways Foundation. Swan Trust laid the groundwork for the purchase by working with the former landowner to protect this natural treasure from development. In addition, the Tennessee Nature Conservancy recently donated the Langford Branch State Natural Area to Swan Trust. This 23-acre preserve is one of several sites in Lewis County that are home to the federally endangered Tennessee Yellow-Eyed Grass. The Trust is cooperatively managing the site with the Division of Natural Heritage.

Swan Trust has been successful in receiving substantial grants for land purchases from the Tennessee Environmental Endowment / Duck River Fund, the North American Wetlands Conservation Act Small Grant Fund, the Norcross Foundation, and the Community Foundation of Middle Tennessee. Generous donations from members and successful fundraising events, such as the annual silent auction, have been essential components of the land purchase effort.

Landowner interest in conservation easements has grown, as development pressure is taking its toll on formerly rural areas. Swan Trust holds and monitors several conservation easements in Perry, Hickman, and Lewis Counties that protect deciduous forests and streams in perpetuity.

A rare opportunity was taken in 2002 when a road-widening project in Lewis County made mitigation funds available for a large bank stabilization project. Swan Trust assisted a landowner, who was losing banks during frequent floods, with his property on Little Swan Creek and Piney Branch. The mitigation funds paid for rock jetties along 943 feet of stream and bio-engineering, designed by the Natural Resources Conservation Service. Follow-up work has consisted of several tree-planting days to re-establish the riparian buffers along the two streams. Tennessee Scenic River Association's Duck River Project donated 500 trees, and local school students and Swan Trust volunteers supplied the labor. Swan Trust is under contract with TDEC to monitor the site for five years.

A concerted public education effort is helping Swan Trust accomplish its mission. Local schools are involved in volunteer monitoring of streams in the Big Swan and Big Bigby headwaters. Monthly outings for the general public feature hikes to scenic sites, threatened habitats, rare plant communities, and protected lands on the Western Highland Rim. In 2004, Swan Trust partnered with the Tennessee Native Plant Society and the Division of Natural Heritage, with funds from an environmental education grant from the EPA, to raise awareness of the importance of deciduous hardwood forests to protect water quality as well as habitat for native flora and fauna. Dinners with noted guest speakers have provided a forum for networking and educational presentations to benefit members, teachers, students, and the general public.

Swan Trust's lands are open to the public for low-impact recreation, enjoyment of nature, and scientific study. Contact us at:

Swan Conservation Trust
PO Box 162
Summertown, TN 38483
931-964-4402
http://www.swantrust.org